

What is claimed is:

1. An analytical method for a liquid sample using near infrared spectroscopy comprising the steps of:

applying near infrared light in a short wavelength range to the liquid sample within a test tube from the outside;

detecting diffusely (scattered) reflected light, diffusely transmitted light, or transmitted and reflected light from the liquid sample by an optical sensor to measure a near infrared absorption spectrum of the liquid sample; and

replacing the measured value with a value obtained from a calibration equation which has been made in advance from a spectrum measured using the same method as above, thereby determining object characteristics of the liquid sample.

2. The analytical method for a liquid sample using near infrared spectroscopy according to claim 1, wherein the wavelength of near infrared light applied to the liquid sample is 700nm ~ 1100nm.

3. The analytical method for a liquid sample using near infrared spectroscopy according to claim 1, wherein the liquid samples are food (such as milk, fruit and vegetable juice, and edible oil), rumen juice, urine, oil, industrial waste water, or lake water.

4. The analytical method for a liquid sample using near infrared spectroscopy according to claim 1, wherein a plurality of test tubes with the same specifications is used as a sample cell in the spectrum measurement of the sample for calibration.

5. An analytical apparatus for a liquid sample comprising:

a block provided with a housing portion for a test tube;

a near infrared apparatus provided with a spectroscope for dispersing near infrared light in a short wavelength range from light from a source of light or the sample and an optical sensor for detecting the near infrared light;

light conduction means for conducting the near infrared light in the short wavelength range emitted from the light source or the spectroscope to the test tube within the housing portion and for conducting, directly or through the spectroscope, diffusely reflected light, diffusely transmitted light, or transmitted and reflected light from the liquid sample within the test tube to the optical sensor; and

control means for outputting a measurement command of a spectrum to the near infrared apparatus and for replacing the measured spectrum with a value obtained

from a calibration equation which has been made in advance, thereby computing object characteristics of the liquid sample.

6. The analytical apparatus for a liquid sample according to claim 5, wherein a white light source such as a tungsten halogen lamp is used as the light source, and a diode array is used as the optical sensor.

7. The analytical apparatus for a liquid sample according to claim 5, wherein the monochromatic near infrared light in a short wavelength range is used as the light source, and a silicon detector is used as the optical sensor.

8. The analytical apparatus for a liquid sample according to claim 5, wherein the light conduction means is an optical fiber or a bundle of the optical fibers.

9. The analytical apparatus for a liquid sample according to claim 5, wherein the block is provided with a temperature control means for stabilizing the liquid sample within the test tube at a predetermined temperature.